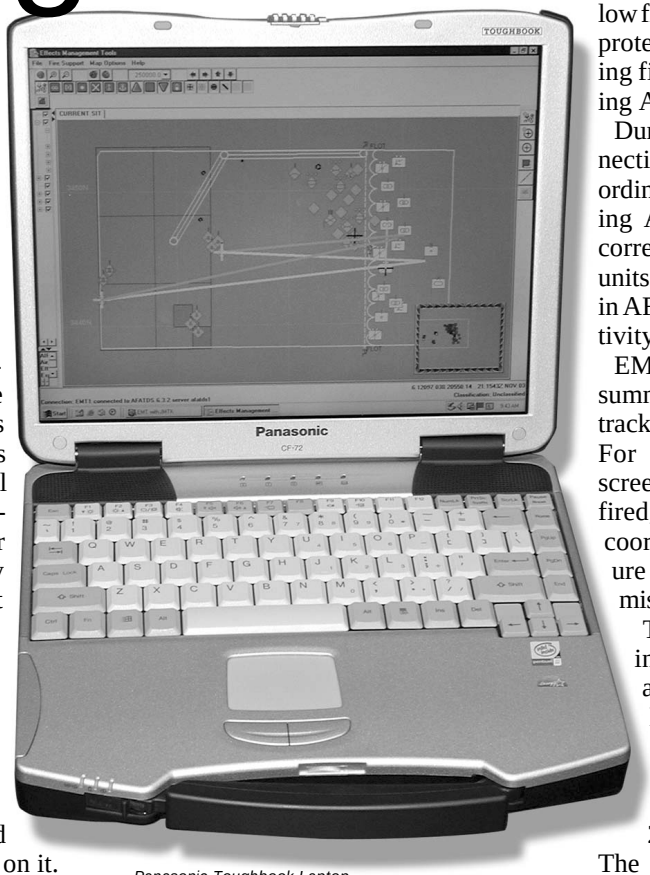
AFATDS Effects Management Tool

By Lieutenant Colonel John L. Haithcock, Jr.

The Advanced Field Artillery Tactical Data System (AFATDS) Version 6.3.1 software currently being fielded was released to the field in January 2003 as units prepared to attack into Iraq. This version improved the technical fire direction features that Version 6.3.0 brought to the user and provided full functionality for the Effects Management Tool (EMT).

While AFATDS was used extensively during Operation Iraqi Freedom (OIF), EMT was not used theater-wide. Some units did not use it because the software came out about the same time they were deploying, and they did not have time to train on it.



Panasonic Toughbook Laptop

As EMT is fielded, the software is getting good reviews. For example, after a recent division Warfighter exercise, Colonel Gary H. Cheek, commander of the 25th Infantry Division (Light) Artillery, Schofield Barracks, Hawaii, wrote, "EMT shows tremendous potential. It was a particularly good tool for me and the Div Arty TOC [tactical operations center]....It made me a believer in the power of such information tools shared throughout the division."

EMT is a client for AFATDS that was developed jointly by the Army and Marine Corps. It provides an intuitive, easy-to-use interface to access AFATDS data rapidly and perform specific tasks without being overwhelmed by the complexities of the more robust AFATDS interface and administration.

This new client software reads information from the AFATDS database and renders this information on a digital map display. It displays unit symbols, battlefield geometries, fire support coordination measures (FSCM), target symbols and both friendly and enemy firing vectors. Users can manipulate data by "drilling down" on the objects to interrogate them and display information maintained within AFATDS.

EMT's capabilities were developed to address concerns from field units, such as having to manually input target lists and air support lists (ASLs) into AFATDS from Excel spreadsheets and Power Point slides received from targeteers. Operators can import Excel spreadsheets into EMT and send the data to AFATDS. (See Figure 1 for the EMT functionalities in EMT Version 6.3.2, due out in January 2004.)

One of EMT's strengths is the ability to rapidly upgrade and revise the software based on evolving user requirements. During preparations for OIF, the Coalition Forces Land Component Commander (CFLCC) needed to rapidly build a list of restricted and protected targets. This list eventually grew to more than 10,000 targets. The number of restricted/protected targets quickly overwhelmed AFATDS and the operators because the list had to be input into AFATDS as FSCMs. Within two weeks, software engineers revised EMT to allow fire supporters to input the restricted/protected list and check it quickly during fire mission processing without using AFATDS assets.

During OIF, another issue was connection failures between AFATDS subordinate and higher headquarters. Fielding AFATDS Service Packs 1 and 4 corrected this problem. As a reminder, units should install all four service packs in AFATDS to greatly improve connectivity and operations.

EMT also has several worksheets and summaries that enable an operator to track, monitor, input or consolidate data. For example, the "Mission Status" screen provides a snapshot of missions fired, those in progress or those being coordinated for a given time. (See Figure 2.) An operator can select one of the missions and display its status in detail.

The EMT application is primarily in the Java programming language and will run on any Windows-based laptop that has at least a 400 megahertz Pentium processor with 550 MB space available on the hard drive for software installation and 256 megabytes of RAM memory. The operating system is Windows NT 4.0 or Windows 2000. EMT also uses some XML components. Because most users are familiar with the Windows operating system, the EMT interface is familiar to users.

Common Operating Picture (COP). EMT's strength is its ability to view a COP that can be tailored to the user's portion of the battlefield. Its display uses the joint mapping tool kit (JMTK) for the Army or Atlas for the Marine Corps.

JMTK is National Imagery and Mapping Agency (NIMA), Bethesda, Maryland, support software for mapping, charting, geodesy and imagery functionality for the global command and control system (GCCS). JMTK is one of the common support applications of the defense information infrastructure common operating environment (DIL COE). JMTK can import user data embedded in mission applications and display it on map and image backgrounds.

EMT also can access and use other mapping tools, such as the Falcon View, digital terrain elevation data and vector product format. JMTK generates symbols using Military Standard (MIL-STD) 2525 symbols and software developed by the Army Space Program Office, Alexandria, Virginia, and can use standard NIMA digital map products.

This mapping capability helps EMT display the status of various types of missions using color schemes. (See Figure 3 on Page 42 for an example of an EMT "Current Situation" window.) The ability to view mission data and vectors along with the different JMTK maps allows a user to track the fight, including the counterfire fight. During major combat operations in OIF, units used EMT frequently to visualize enemy fires for counterfire. The EMT operator can track radars, friendly and enemy artillery positions, radar zones and display vectors.

The Marines have integrated EMT into their command and control personal computer (C^2PC) designed in 1995. C^2PC is Windows-based software that facilitates military command and control. It can be used as a stand-alone tool to produce overlays and operational graphics or be connected to a computer network to depict the locations of friendly and enemy units and share overlays and message traffic instantly. The Defense Information Systems Agency, Arlington, Virginia, has accepted C^2PC as a joint common tactical picture (CTP) workstation.

- Establishes targets.
- Initiates fire mission.
- Creates a target list worksheet.
- Creates target lists.
- Creates geometries.
- Develops a geometry worksheet.
- Displays geometry data.
- Imports/exports a spreadsheet of geometries.
- Views guidances.
- Displays target data.
- Monitors missions.
- Creates an air support list (ASL).
- Creates air support requests (ASRs) on an ASL.
- Imports/exports a spreadsheet of ASRs.
- Provides tools for collaboration with other systems (video teleconferencing, real-time display of commander's drawing on white board or map, voice or text chat rooms, etc.).
- Shows unit moves.
- Provides a coordinate conversion tool.
- Displays a dynamic filter window.
- Maintains the no-strike list.
- Allows for expanded target types.
- Tracks check fires/cancels check fires.
- Allows user to select role/duties to avoid irrelevant data (targeteers, planners, technical fire direction, tactical fire direction, etc.).

Figure 1: Effects Management Tool (EMT) Functionalities in EMT Version 6.3.2 (January 2004)

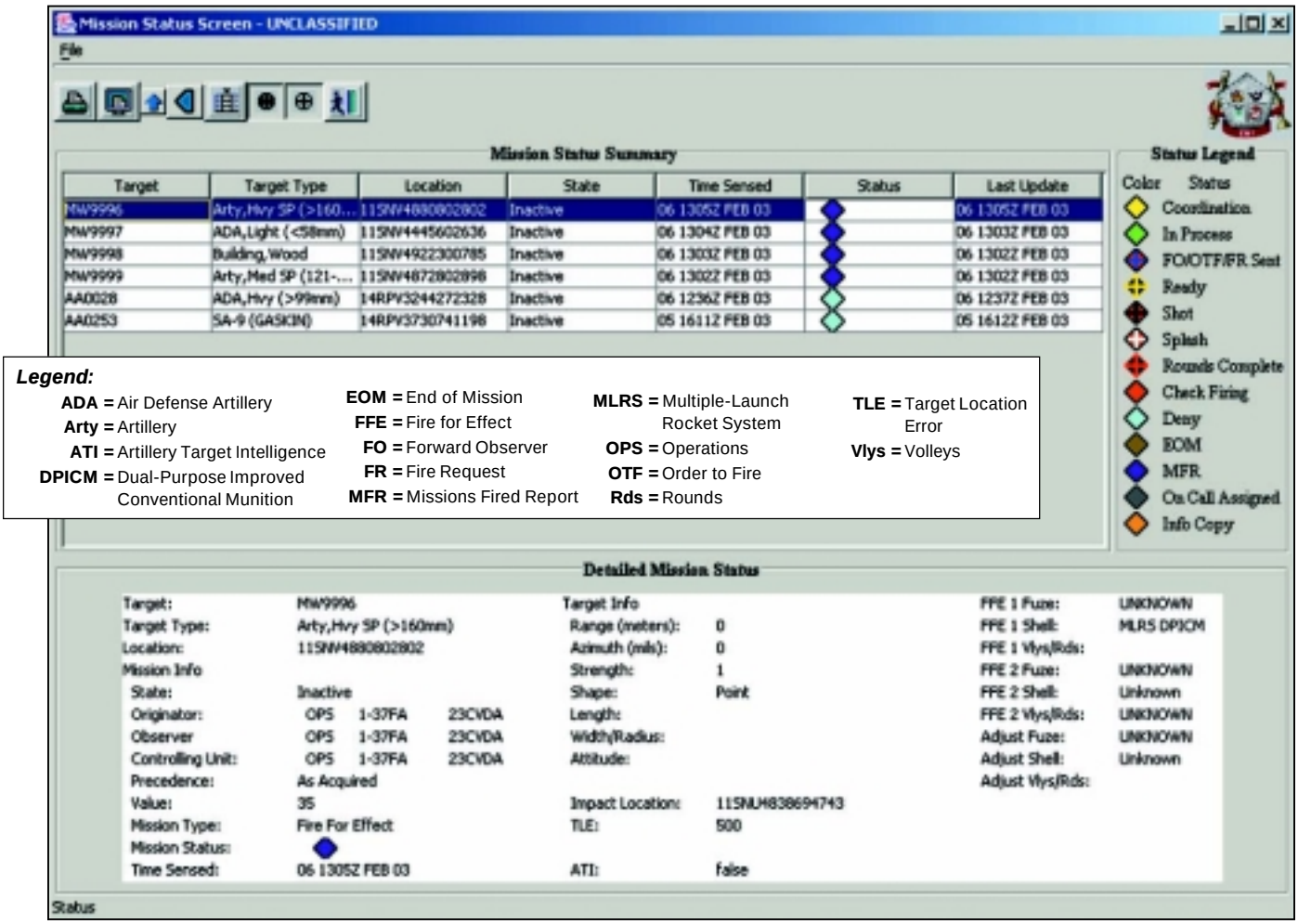


Figure 2: AFATDS EMT "Mission Status" Window

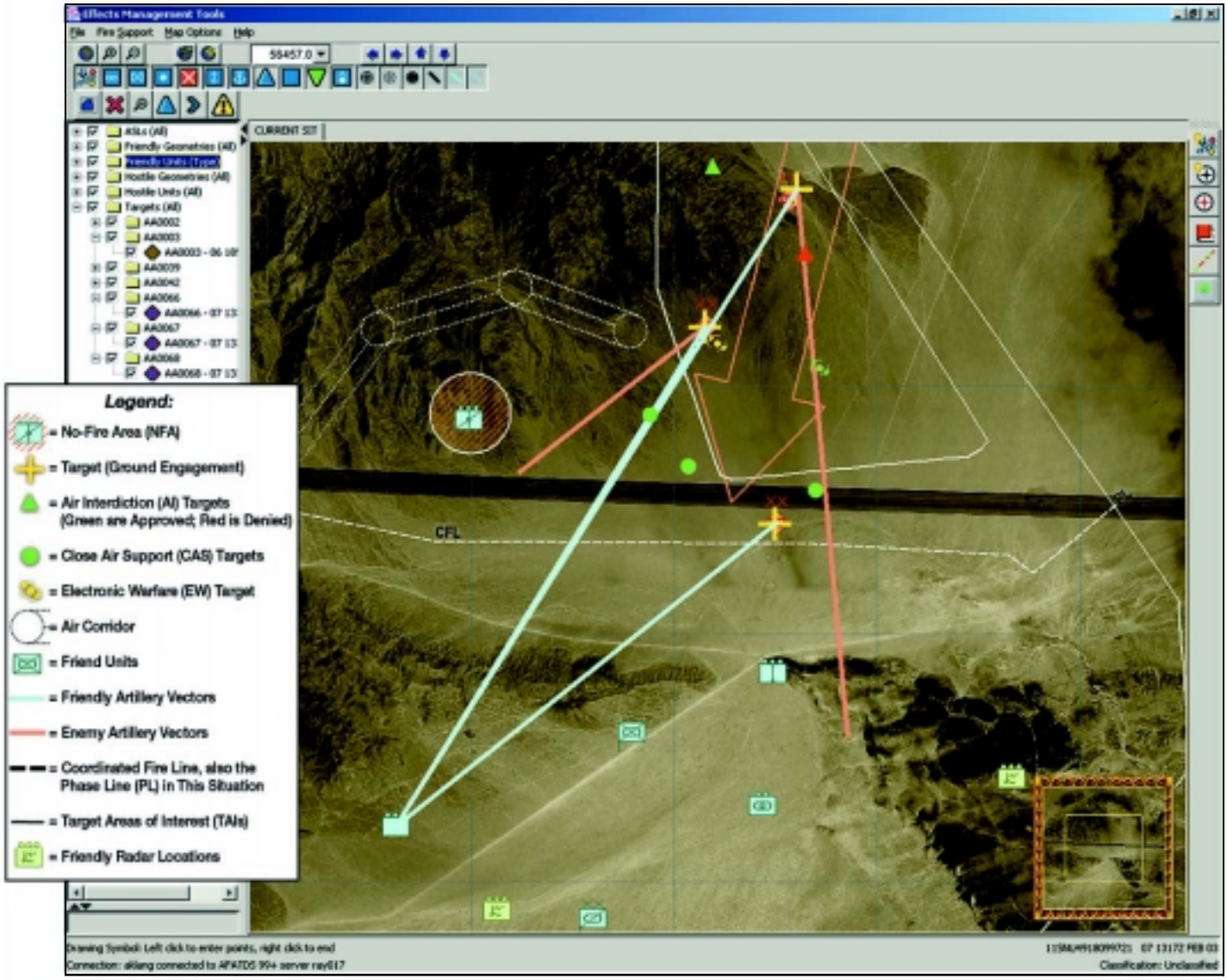


Figure 3: EMT Display of Current Situation

A C²PC-based EMT allows the operator to simultaneously view and action information available from multiple sources. C²PC-based EMT supports overlaying fire support, maneuver and intelligence data from AFATDS, the USMC's intelligence and operations servers (IOS), GCCS-Army and GCCS-Maritime onto a single Windows laptop display.

Improvements in the Next Two EMT Software Versions. There are many improvements planned for the next two versions of EMT: Version 6.3.2 to be fielded in January and Version 6.4.0 tentatively scheduled to be fielded in October 2004.

Kill Box Tool. EMT Version 6.3.2 will include the common grid reference system (CGRS), a kill box tool. CGRS will allow the operator to build, number and activate/inactivate kill boxes. Once activated, a kill box will send an FSCM to AFATDS to ensure no violations occur.

This tool is being developed using both Central Command's and the Korean theater's standing operating procedures (SOPs) and other tools.

Auto Suppression of Enemy Air Defenses (Auto SEAD). This tool will allow an operator to look for targets along an established air corridor. This function will be in the EMT Version 6.3.2.

Digital Terrain Elevation Data (DTED) Access and Terrain Analysis. AFATDS Version 6.3.2 will improve the way users study and use terrain. EMT will interface directly with the modernized integrated database (MIDB) to allow higher echelon headquarters to build target folders and lists.

Build Fire Plans on Laptops. EMT Version 6.4.0 will allow fire support officers (FSOs) to build fire plans. A task force FSO will be able to generate his fire plan on his laptop while sitting around the planning map without having to wait until he gets back to AFATDS.

Smart Range Fans. This feature in AFATDS Version 6.4.0 will allow the operator to take a firing unit and consolidate its multiple range fans into a single range fan based on ammunition range. The user will be able to visualize multiple enemy battalions quickly and minimize the number of range fans on a display.

Other Improvements. Planned improvements for software versions after 6.4.0 include the ability to update and delete friendly units, enhance the map display and improve vector display and management.

Another improvement will be the ability to check friendly units to enhance clearance of fires procedures and pre-

vent fratricide. Currently, units use FSCMs to clear fires. The new function will look for friendly units in the area of a fire mission and alert the user if a friendly unit is close by.

New Requirements Based on OIF. Some EMT requirements are based on feedback from units in OIF. The following requirements will be incorporated in EMT as quickly as possible with the potential for some to be incorporated into Version 6.4.0.

Edit Target and Unit Data. EMT should allow the user to edit target and unit data for planning purposes, as is the case with EMT geometries.

View Technical Fire Data. EMT currently cannot view the same cannon data that AFATDS displays—it needs to allow the user to view technical fire data.

Modify the ASL and Air Support Request (ASR) Numbers. EMT was used frequently during OIF to generate the ASL, particularly at higher headquarters. However, once EMT sent the ASL to AFATDS, operators could not modify the ASL or assign/change ASR numbers. Future versions of EMT will allow the user to edit targeting information—target locations and types, ASR numbers, etc.

Additional functions will be added as users in the field determine what they need.

Fire Support Coordinator Synchronization Tool (FSCOORD ST). The next evolution in the EMT family of clients will be the FSCOORD ST that is scheduled to be fielded in May of 2005. FSCOORD ST will provide EMT-like functions over the tactical local area network (LAN) or combat net radios, such as the single-channel ground and airborne radio system (SINCGARS) and the enhanced position location reporting system (EPLRS).

This tool will replace the FSCOORD's "shoot board" that typically contains the map, overlays (maneuver graphics; targets, firing positions and range overlays; etc.), target list(s), schedule of fires, fire support execution matrix (FSEM), maneuver synchronization matrix and ammunition status. For the first time, the FSCOORD will have an on-the-move digital capability that will provide him relevant and near-real-time tactical information on fires, targets, units, FSCM/geometries and mission status derived from AFATDS. The FSCOORD ST will provide the user Microsoft applications' look and feel. The software's intent is to link the FSCOORD digitally with the AFATDS-based fires command and control network to improve timeliness and quality of tactical decision making in the delivery of fires and effects.

EMT Fielding. AFATDS/EMT will be in the field for many years to come—well after the first future combat system (FCS)-equipped brigade is fielded in 2010. EMT has the potential for providing an easy and quick fire support interface with combined and joint systems, increasing the responsiveness and effectiveness of fire support.

EMT has been fielded to every active and Army National Guard unit that currently has AFATDS and is being fielded simultaneously with AFATDS to units in new equipment training (NET). The active Army FA is fully fielded while more than 50 percent of the ARNG FA units have been fielded.

EMT is being fielded to fire support elements (FSEs), fire control elements (FCEs), intelligence sections and operations sections at all levels. It can be used with any AFATDS- or C^2PC-equipped unit with AFATDS Version 6.3.1.

The Training and Doctrine Command (TRADOC) System Manager for FA Tactical Data Systems (TSM FATDS) at Fort Sill, Oklahoma, is the user representative that gathers feedback from the field to improve AFATDS'/EMT's functionality. Units can provide TSM FATDS comments and recommendations on the FATDS Software Hotline at 580-442-5607 (DSN 639), the FATDS Training Hotline at 580-442-3390 (DSN 639) or fax the suggestions to 580-442-2915 (DSN 639). Units also can visit the TSM FATDS web page at www.army.mil\TSM_FATDS.

History of EMT Development

The development of EMT began in 1997 as an Independent Research and Development project by Raytheon Corporation. The product at that time was known as the "fire support client" and was developed as part of the Joint Warfighter Interoperability Demonstration (JWID) with an MS Windows "look and feel" for ease of use.

The Program Manager for Intelligence and Effects (PM Intel and Effects), Fort Monmouth, New Jersey, then began work on a similar client, called the "air support client" (ASC). ASC provided prototype capabilities to plan, coordinate and synchronize the delivery of surface-to-surface and air-to-surface effects and interfaced with the USAF theater battle management core system (TBMCS) via its host the Advanced FA Tactical Data System (AFATDS). ASC was designed to operate on existing tactical local area networks (LANs) at the division fire support element (FSE), corps FSE, deep operations coordination cell (DOCC), air operations center (AOC) and the air support operations center (ASOC).

In August 2002, the functionalities of FSC and ASC were merged into EMT and several new functions were added.

EMT is a tool for remote users of AFATDS to command and control fires and effects, building on the military's objective of a network-centric warfare environment. EMT provides leaders the information on the AFATDS in a useful, timely manner as part of the command, control, communications, computers and intelligence (C^4I) architecture. EMT was first released in January 2003 along with AFATDS Version 6.3.1.

Lieutenant Colonel John L. Haithcock, Jr., is the Assistant Training and Doctrine Command (TRADOC) Systems Manager for FA Tactical Data Systems (TSM FATDS), part of the Futures Development Integration Center (FDIC) at Fort Sill, Oklahoma. In his previous assignment, he was the Plans Officer for the 3d Battlefield Coordination Detachment (BCD), Joint and Combined Forces in Korea. He commanded 3d Battalion, 30th Field Artillery, also at Fort Sill, and A Battery, 6th Battalion, 41st Field Artillery, part of the 3d Infantry Division (Mechanized) in Germany. Among other assignments, he was the Deputy Fire Support Trainer and S3 Combat Trainer at the National Training Center, Fort Irwin, California; Battalion Executive Officer and S3 plus Brigade Fire Support Officer for the 1st Battalion, 9th Field Artillery, 3d Infantry Division at Fort Stewart, Georgia.